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Index Form Equations and Monogenized Orders in Quartic Number Fields

We will explore the question of counting the number of monogenic orders, those that are generated by a single element as an integral ring, with given index in a quartic number field. This will require the study of index form equations. In particular, we will discuss how the resolution of an index form equation can give precise information on the number of distinct monogenized orders of a given index, as well the number of monogenizations of a given order.